

OCT 09 2008

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Michel et al.:

Docket: 2002DE124

Serial No.: 10/523,502

Group Art Unit: 10/523,502

Filed: 02/02/2005

Examiner: Burney, Rachel L.

For: Use Of Salts Of Layered Double Hydroxides

DECLARATION UNDER 37 CFR 1.132

I, Dr. Eduard Michel, state that I am a resident of D-79418 Schliengen, Federal Republic of Germany; that I am a citizen of the Federal Republic of Germany; that I am a chemist having graduated at the University of Freiburg, Federal Republic of Germany; that I am one of the inventors of U.S. Patent Application Serial No. 10/523,502; for "Use of Salts of Layered Double Hydroxides"; that I am also one of the inventors of US 6,207,335; that I consider myself qualified, by my knowledge of chemistry, and especially of electrophotographic toners and developers and by my 8 years' experience in this field; that I have made the following observations to wit:

In order to test the performance of a hydrotalcite-based toner containing an organic anion according to the selection of U.S. Patent Application Serial No. 10/523,502 compared to the selection according to Ziolo (US 5,288,581) the following experiments were made:

A) Synthesis of layered double hydroxide salts:

The synthesis was carried out as described in Preparation Example 1 (Syntal HAS 696) or Preparation Example 2 (Syntal HSAC 701 calc) of U.S. Patent Application Serial No. 10/523,502.

B) Test conditions

The test toner was prepared as described in Application Example 2 of U.S. Patent Application Serial No. 10/523,502.

Measurement was carried out using a conventional q/m measurement setup. A screen with a mesh size of 50 μm was used to make sure that, when the toner was

blown out, no carrier was ejected with it. Measurements were carried out at 50 % relative atmospheric humidity. The q/m values ($\mu\text{C/g}$) were measured as a function of the activation period (5 minutes, 10 minutes, 30 minutes, 2 hours).

Charge q/m in $\mu\text{C/g}$					
Hydrotalcite: 120min	Anlon A:	5 min	10 min	30 min	
Syntal HSA 696 3	Lauryl sulfate	-6	-4	-3	-
Syntal HSA 696 2	Dodecyl sulfonate	-4	-3	-3	-
Syntal HSA 696 -8	Acetate	-9	-10	-10	
Syntal HSAC 701 -13	Salicylate	-11	-13	-13	
Syntal HSAC 701 -12	Terephthalate	-13	-13	-12	

Summary of the Invention Examples of U.S. Patent Application Serial No. 10/523,502:

		Charge q/m in $\mu\text{C/g}$				
Prep. Ex.	Hydrotalcite:	Anion A	5 min	10 min	30 min	120min
1	Syntal HSA 696	Benzoate	-23	-23	-24	-27
2	Syntal HSAC 701	4-toluenesulfonate	-21	-23	-24	-26
3	Syntal HSA 696	Dithiodisallylate	-22	-23	-25	-25
11	Syntal HSAC 701	Naphtalene-2-sulfonate	-20	-23	-26	-25
12	Syntal HSAC 701	1-Naphtoate	-19	-24	-28	-30

Results:

The Test clearly shows that an electrophotographic toner comprising a hydrotalcite / Anion combination according to U.S. Patent Application Serial No. 10/523,502 exhibits a noticeably (i) higher negative charge level, and (ii) more rapid attainment of the charge, and (iii) better constancy of this charge over an extended activation period compared to a toner comprising a hydrotalcite / Anion combination according to US 5,288,581.

Evaluation of Results:

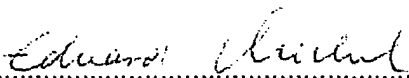
As I am one of the inventors of US 6,207,335 I can state that the metal carboxylates and sulfonates of that patent are fairly good charge control agents with respect to charge level after adequate activation time, but we had no idea at the time we made that invention how to improve charge constancy and rapid chargability. Ziolo could not give us any motivation to look for a certain selection of anions with hydrotalcite, because the Ziolo data with salicylate etc. did not even provide a sufficient charge level.

It was unpredictable from my former invention and from Ziolo (US 5,288,581) that a combination of a hydrotalcite with the instant anions would cause a simultaneous improvement of said toner characteristics (i) – (iii).

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Muttenz,

October 8th, 2008


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(Eduard Michel)